

# PATENT SPECIFICATION

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## (54) IMPROVEMENTS RELATING TO MOUNTING FUEL INJECTION NOZZLES ON INTERNAL COMBUSTION ENGINES

(71) We, ROBERT BOSCH GMBH, a German Company, of Postfach 50, 7 Stuttgart 1, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a device for mounting a fuel injection nozzle on an internal combustion engine.

German Patent Specification No. 1010783 describes such a device which has a flange which clamps the injection nozzle to the cylinder head by means of screws. This known flange comprises a forged or hot-pressed single part which has the disadvantage of being relatively expensive to produce.

A feature of the invention is to provide a flange which, while being as durable and resilient as the known flange, is substantially less expensive to produce.

In accordance with the invention, the flange of a nozzle mounting device comprises several sheets, which are disposed one above another with their adjacent surfaces abutting one another and which are prevented from lateral displacement relative to one another.

Preferably projections on one sheet engage into corresponding recesses in an adjacent sheet to prevent relative displacement between the sheets.

Advantageously, the projections and recesses are produced by impressing on one side of the sheet and correspondingly pressing out the reverse side. Afterwards, the sheets can be pressed together, thereby pressing the projections into the recesses whereby the sheets are held together. This means that not only can the sheets no longer be displaced one on top of the other but also the bending strength is increased since, when there is bending stress, the

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projections engaging in the recesses are loaded in shear. The sheets which are used for this production may be about 5mm thick so that small machine tools can be used which operate with a high quantity and low energy costs. As already described initially, a forging process which entails a great deal of energy, tools and time, in particular in the case of hot-forging, is required for the known 15 mm thick flange.

The flange after being pushed onto the injection nozzle can be peened over into a corresponding recess in the periphery of the injection nozzles. Such a recess can comprise a groove turned in the injection nozzle.

The invention is further described, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a longitudinal section of one embodiment of clamping device in accordance with the invention.

Fig. 2 is a view of the flange with a cross section through the nozzle holder, and

Fig. 3 is a detail section through the flange on the line III-III of Fig. 2

A flange 2 comprising several sheets is pushed onto a nozzle holder 1 (partly illustrated in section) of a fuel injection nozzle of an internal combustion engine. A groove 3 is turned in the peripheral surface of the nozzle holder 1. The upper edge of the bore 4 of the flange which holds the nozzle holder 1 is peened into this groove 3. As illustrated in Fig. 2, the flange 2 has bores 5 through which are inserted the screws by which the injection nozzle is clamped by the flange onto the cylinder head (not shown). Furthermore, as is illustrated in Fig. 3, pressed-in parts 7 are provided in the sheets, these parts 7 registering with pressed-out parts 6 on the reverse side of the sheet. These projections and recesses are interlocked and then pressed together

so that there is a firm connection. As a result, the sheets are prevented from displacement one on top of the other which is particularly advantageous in the event of bending stress.

WHAT WE CLAIM IS:—

1. A device for mounting a fuel injection nozzle on an internal combustion engine comprising a flange by which the injection nozzle can be clamped to the cylinder head by means of screws, said flange comprising several sheets, which are disposed one above another with their adjacent surfaces abutting one another and which are prevented from lateral displacement relative to one another.

2. A device as claimed in claim 1, in which projections on one sheet engage into corresponding recesses in an adjacent sheet to prevent relative lateral displacement between the sheets.

3. A device as claimed in claim 2, in which the projections and recesses are

produced by impressing on one side of the sheet and correspondingly pressing out the reverse side.

4. A device as claimed in claim 2 or 3, in which the sheets are pressed together, thereby pressing the projections into the recesses whereby the sheets are held together.

5. A fuel injection nozzle provided with a device as claimed in any preceding claim, in which the flange, after being pushed onto the injection nozzle, is peened over into a corresponding recess in the periphery of the injection nozzle.

6. A device for mounting a fuel injection nozzle on an internal combustion engine, constructed substantially as herein described with reference to and as illustrated in the accompanying drawings.

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Fig. 1

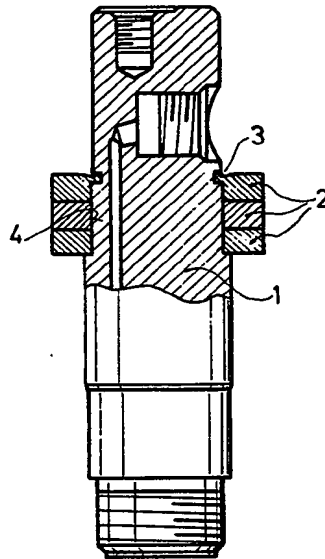


Fig. 2

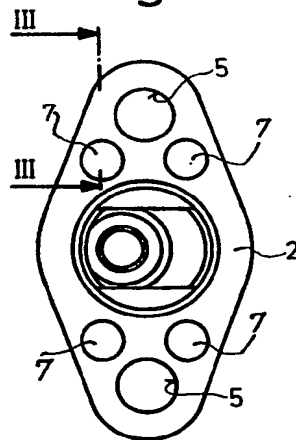
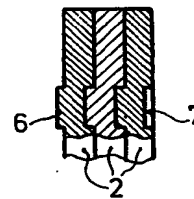


Fig. 3



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